The wind velocities derived from this and other train drift studies are not incomparable in magnitude with velocities encountered nearer the surface. The conditions in the lower atmosphere near the time of the fireball is, therefore, of some interest. Table 3 is made up from data taken from the records of the Knoxville Weather Bureau office for that date.

This is the third velocity of the drift of a meteor train secured by the American Meteor Society within a year. It further illustrates most excellently what can be accomplished by cooperative effort.

For this paper, the initiative in observing and in securing the reports of others is due to S. Bunch; also an independent solution was made by him. C. P. Olivier has made a critical study of the data, computed the quantities given under his name, and exercised a general supervision, as is usual in the American Meteor Society work.

The highest wind velocity observed at Knoxville by the pilot-balloon method was at 1.5 km above surface, 201.6 km per hour, but this was in November. Summer velocities of near 100 km per hour have been observed.

AN 18-DEGREE HALO

By E. MONROE HARWOOD

[Blue Hill Meteorological Observatory, Milton, Mass., December 1933]

A lunar halo at Blue Hill Observatory, Milton, Mass. which began at 7:10 p.m. (E.S.T.) October 4, 1933, and continued until after 12:40 a.m., October 5, at first was mistaken for the common one of 22° radius but later seemed noticeably smaller; so measurements were made on it with an astronomical stick graduated in degrees and tenths. At 12:40 a.m., October 5, two such measurements both showed 18°12′ as the angle from the near edge of the practically full moon to the inner edge of the halo, horizontally, on the right-hand side of the moon. The halo was of marked brightness. No other halo was observed at the time, but there was a bright corona, of approximately 3° radius. The sky was completely covered with cirrostratus in a uniform sheet.

NOTE.—This halo is the 18°58′ halo (yellow light) listed in "Physics of the Air", 2d edition, page 517, produced by pyramidal faces inclined to each other 53°58′. Clearly, because red light, corresponding to the inner edge of the halo, gives a radius of 18°20′ which, when diminished by the radius of the moon, 15′, to correspond with the angular distance measured by Mr. Harwood, reduces to 18°5′, a value identical, to well within the observational errors, with that which he found, namely, 18°12′.—Editor.

A HALO OF UNUSUAL RADIUS

By ROBERT G. STONE and SALVATORE PAGLIUCA

[Mount Washington Observatory, Gorham, N. H., Oct. 7, 1933]

From 7:30 p.m. until sometime after 10 p.m., October 4, 1933 (75th meridian time) we saw from the Mount Washington Observatory, New Hampshire, 1,911 meters above mean sea level, a bright, complete, circular halo that, with a theodolite, repeatedly and consistently measured 23.5° from its inner edge to the proximal limb of the nearly full moon. The elevation of the moon above the horizon at 9 p.m. was about 37°.

The ring was of approximately equal brightness and width all around. No trace of the 22°-halo, or any other halo than the one measured, was seen. The sky was completely covered with a thick uniform veil of cirrostratus (species, *nebulosus*, in the 1932 International Atlas of Clouds) that appeared to be unusually low (the appearance of the sky is almost exactly reproduced on plate 43 of 1932 International Atlas of Clouds). The pressure had been falling slowly since morning after 2 days of high barometer and fair weather. Delicate cirrus prevailed during the day, giving way to cirrostratus about 6 p.m. The temperature at 8 p.m. was 30.6° F.; relative humidity, 71 percent; wind, ESE (all day) at 17 meters per second.

The halo was first measured several times with an astronomical stick which though giving only rough readings, indicated radii considerably greater than 22°. Suspicion and curiosity were thus aroused and readings then made with a Keuffel and Esser theodolite of modern design adapted to pilot balloon observations. These measurements were made in three ways, viz: (1) from the outer proximal limb of the moon *right* to the inner edge of the halo, (2) from the outer proximal limb of the moon *up* to the inner edge of the halo, and (3) from the inner edge of the left limb of the halo horizontally through the center of the moon to the inner edge of the right limb of the ring, and, as stated, repeated several times with always the same result.

At 8 p.m., the same evening, L. A. Wells at the Blue Hill Observatory, Milton, Mass., noted 0.8 Cirrus and Cirrostratus filosus, at an estimated altitude of 8 km., moving from SW. at a speed which earlier observations indicated to be approximately 25 meters per second. A solar halo, beginning at 8:04 a.m., exhibited right and left parhelia from 4:05 p.m. until after 4:10 p.m. A lunar halo began at 7:10 p.m. and continued until after 12:40 a.m., October 5, with an equally bright corona of approximately 3° radius also persistent. Finger measurements of the solar halo by E. M. Harwood indicated 22° approximately. Astronomical stick measurements of the lunar halo at 12:40 a.m. the 5th gave 18.2° as the radius in two readings taken from the apparent edge of the moon to the inner edge of the halo, horizontally, on the right-hand side of the moon. Observer Harwood noted even before making the measurements the small size of that halo and its marked brightness. No other halo was observed at the time; the sky was completely covered with Cirrostratus in a uniform sheet.

(All times given above are 75th meridian time (E.S.T.).)